Amendments to the Claims

No Admission. The claims presented below are labeled pursuant to the request of the Patent and Trademark Office for convenience in examination. The cancellation of a claim or reference to a claim as "currently amended" is not an admission that the claim was altered for any reason related to patentability.

The amendments presented below were previously presented; however, the Notice indicated that the markings on the amended claims were not in dark ink, and claims 7-10 presented lettering in too small a font, presumably due to the chemical structures presented. Therefore, the amendment provided below is submitted to replace the previously submitted amendment, with claim indicators as originally provided. Note additional claims have been added.

The claim listing below replaces all prior versions and listings of claims in this application:

Listing of Claims

1. (Currently Amended) An energy transfer assay method for analyzing binding of a sensor polynucleotide binding protein to a target polynucleotide comprising:

providing a sample that is suspected of containing a target polynucleotide;

providing a ~~polycationic multichromophore~~ conjugated polymer that interacts with the target polynucleotide and upon excitation is capable of transferring energy to a signaling chromophore;

providing a sensor polynucleotide binding protein (PBP) that can bind to the target polynucleotide, said sensor PBP conjugated to the signaling chromophore;

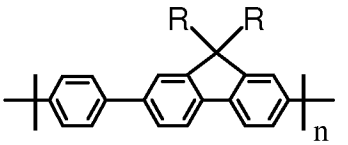
contacting the sample with the sensor PBP and the ~~multichromophore~~ conjugated polymer in a solution under conditions in which the sensor PBP can bind to the target polynucleotide, if present;

applying a light source that can excite the ~~multichromophore~~conjugated polymer; and

detecting whether light is emitted from the signaling chromophore, thereby indicating binding of the sensor polynucleotide binding protein to the target polynucleotide.

2-6. (Cancelled)

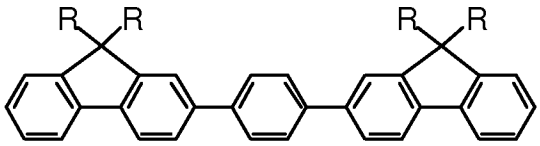
7. (Withdrawn, Currently Amended) The method of ~~claim 6~~claim 1, wherein the conjugated polymer has the structure



3 R= -$(CH_2)_6\overset{+}{N}Me_3\overset{-}{I}$

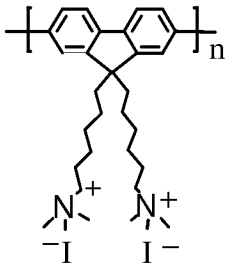
where n=2 -100,000.

8. (Withdrawn, Currently Amended) The method of ~~claim 6~~claim 1, wherein the conjugated polymer has the structure



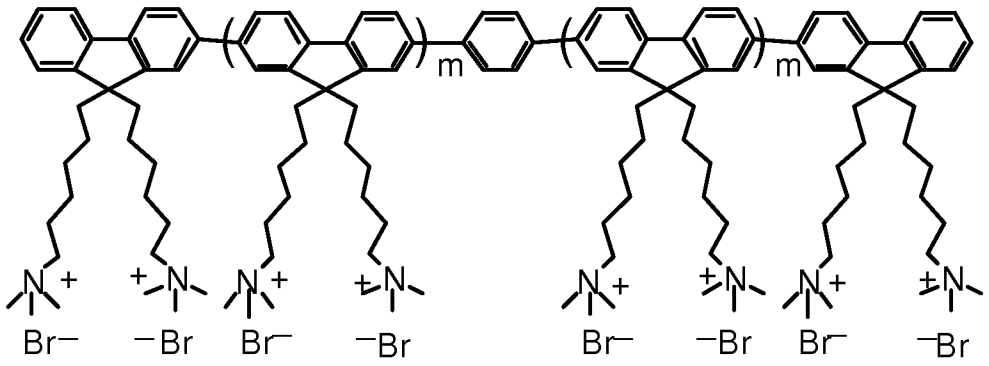
4 -R = -$(\overset{\oplus}{C}H_2)_6\overset{\ominus}{N}Me_3$ I

9. (Currently Amended) The method of ~~claim 6~~claim 1, wherein the conjugated polymer has the structure



where n=2-100,000.

10. (Withdrawn, Currently Amended) The method of ~~claim 6~~claim 1, wherein the conjugated polymer has the structure



where m = 1 or 2.

11. (Cancelled)

12. (Currently Amended) The method of claim 1, wherein the sample is contacted with the sensor PBP and the ~~multichromophore~~ conjugated polymer in the presence of a sufficient amount of an organic solvent to decrease hydrophobic interactions between the sensor PBP and the ~~multichromophore~~conjugated polymer.

13. (Previously Presented) The method of claim 1, wherein the sample is contacted with a plurality of different sensor PBPs, said different sensor PBPs comprising a corresponding different signaling chromophore, wherein each of said different sensor PBPs can selectively bind to a corresponding different target polynucleotide.

14. (Previously Presented) The method of claim 1, wherein the chromophore is a fluorophore.

15. (Previously Presented) The method of claim 14, wherein the fluorophore is selected from a semiconductor nanocrystal, a fluorescent dye, a lanthanide chelate, and a green fluorescent protein.

16. (Withdrawn) The method of claim 15, wherein the fluorophore is a semiconductor nanocrystal.

17. (Previously Presented) The method of claim 15, wherein the fluorophore is a fluorescent dye.

18. (Previously Presented) The method of claim 17, wherein the fluorescent dye is fluorescein.

19. (Withdrawn) The method of claim 15, wherein the fluorophore is a lanthanide chelate.

20. (Withdrawn) The method of claim 1, wherein the target polynucleotide is DNA.

21. (Previously Presented) The method of claim 1, wherein the target polynucleotide is RNA.

22. (Previously Presented) The method of claim 1, wherein the sample comprises single-stranded target polynucleotide.

23. (Withdrawn) The method of claim 1, wherein the sample comprises double-stranded target polynucleotide.

24. (Withdrawn) The method of claim 1, wherein the target polynucleotide is produced via an amplification reaction.

25-26. (Cancelled)

27. (Previously Presented) The method of claim 1, wherein light emitted from the signaling chromophore above a threshold level indicates that the target polynucleotide is present in the sample.

28. (Previously Presented) The method of claim 1, wherein the amount of light emitted from the signaling chromophore is quantitated and used to determine the amount of the target polynucleotide in the sample.

29. (Withdrawn) The method of claim 15, wherein the fluorophore is a green fluorescent protein.

30. (Previously Presented) The method of claim 1, wherein the target polynucleotide is not amplified.

31. (Previously Presented) The method of claim 1, wherein the method is performed on a substrate.

32. (Currently Amended) The method of claim 1, wherein the amount of light emitted from the signaling chromophore upon excitation of the ~~multichromophore~~ conjugated polymer is greater than the amount of light obtained upon direct excitation of the signaling chromophore.

33. (Currently Amended) An energy transfer assay method for analyzing binding of a sensor polynucleotide binding protein to a target polynucleotide comprising:

providing a sample that is suspected of containing a target polynucleotide;

providing a ~~polycationic multichromophore~~ conjugated polymer that interacts with the target polynucleotide and upon excitation is capable of transferring energy to a signaling chromophore;

providing a sensor polynucleotide binding protein (PBP) that can bind to the target

polynucleotide, said sensor PBP conjugated to the signaling chromophore;

contacting the sample with the sensor PBP and the ~~multichromophore~~ conjugated polymer in a solution under conditions in which the sensor PBP can preferentially bind to the target polynucleotide, if present;

applying a light source that can excite the multichromophoreconjugated polymer; and

detecting whether light is emitted from the signaling chromophore, thereby indicating binding of the sensor polynucleotide binding protein to the target polynucleotide.

34. (New) A method of performing energy resonance transfer comprising (a) combining a conjugated polymer, a polynucleotide binding protein and a signaling chromophore with a sample suspecting of containing a target polynucleotide under conditions in which the polynucleotide binding protein can bind to the target to form a complex, and (b) detecting emission from the signaling chromophore upon excitation of the conjugated polymer indicating complex formation, wherein the emission is larger than that obtained from direct excitation of the signaling chromophore.

35. (New) The method of Claim 34, wherein the emission is at least 10 times larger than that obtained from direct excitation of the signaling chromopohore.

36. (New) The method of Claim 34, wherein the emission is at least 25 times larger than that obtained from direct excitation of the signaling chromophore.

37. (New) The method of Claim 34, wherein the emission is at least 30 times larger than that obtained from direct excitation of the signaling chromophore.